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ABSTRACT

This study examined the extent to which caregiving nurturance expressed in mothers' working models of infant feeding changed during the infant's first year and explored the influence of the infant's biologic development on this caregiving nurturance. Three methodologies were used: (1) 59 mothers of very-low-birth-weight (VLBW) infants with a history of lung disease and 53 mothers of healthy infants born at term were interviewed for dimensions of a working model of infant feeding; (2) the intensity of the infants' illness was assessed from a record of illness signs; and (3) the infants' weight compared to that of other infants was assessed in terms of weight-for-age. The results show that the caregiving nurturance of mothers' working models of infant feeding, on the whole, was not stable through the infant's first year. The results indicate that the mother's characteristics and personal experiences in feeding, environmental circumstances, and the meaning of infant behavior and characteristics are factors that potentially shape a mother's working model of infant feeding and are in need of exploration. (Contains 15 references.) (AP)

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Mothers' Working Models of Feeding: How Stable Are They Through the First Year

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Mothers' Working Models of Feeding: How Stable Are They Through the First Year

For mothers of a very young infant, the infant's feeding is a setting that structures much of the physical activity and interaction a mother has with her infant. Maternal working models are dynamically and affectively elicited potentials for rediscovering and creating expectations that operate during goal-corrected activity (Bowlby, 1982; Bretherton, 1985; West & Sheldon-Keller, 1994). Through the operation of working models, perception is organized, information is interpreted, recategorized and transformed, actions are directed, and the experience of the activity is appraised (Main, Kaplan, & Cassidy, 1985). Although working model theory was formulated by Bowlby (1982) in the context of attachment relationships, working models are likely to be operative in any goal-corrected activity in a social context (Stern, 1989).

Dimensions of a working model of infant feeding concern self, other (the infant), and the relationship of self and other in feeding. Dimensions are specified by the issues and processes with which a mother is concerned during on-line problem solving and interaction with her infant. The quality of these dimensions is likely to vary from mother to mother in respect to the caregiving nurturance that is expressed (George & Solomon, 1989). Caregiving nurturance refers to the extent to which the mother, through ways of thinking specific to each working model dimension, is supportive of the infant's dietary intake, feeding satisfaction, growth, development as a participant in the feeding, and of the mother-infant relationship.

Working models are developed through caregiving experience (Bowlby, 1988). As the infant develops, the mother's working model of infant feeding must change to accommodate the infant's new capacities and agendas and as the mother encounters new challenges in feeding her infant (Bretherton, 1985; Bowlby, 1988). Little is known about the extent to which the issues and processes of a mother's working model of infant feeding change or remain stable as the infant develops.

The caregiving experience of mothers is conditioned not only by the infant's developmental accomplishments and agendas. It is also likely to be conditioned by the infant's biologic characteristics and the challenges and demands these characteristics present to caregiving (Parmelee, 1989). The caregiving experience of mothers of very-low-birth-weight (VLBW) premature infants with a history of lung disease is likely to be different from that of mothers of infants who were healthy and born at term.

Little is known about the extent to which a mother's working model of infant feeding is conditioned by the infant's initial biologic status (i.e., maturity at birth and early respiratory health or disease), intercurrent acute illness, and weight relative to that of other infants. An infant's deviation from expected maturity at birth and expected respiratory health in the early days and weeks of life could be associated with more change in the mother's working model of infant feeding as the infant grows older and develops feeding competencies than is the case for mothers of infants who are mature (term) at birth and in good respiratory health and for whom feeding experiences are more like what was expected than not. The revision in the working model of a mother of a VLBW infant that is expected as the infant grows older could be influenced by intercurrent acute illness and how much care it requires and by the infant's deviation in weight from that of the population of children the same age. Illness and poor growth in weight may condition the feeding context and, hence, the nature of the working model of feeding that a mother employs (Light & Butterworth, 1993; West & Sheldon-Keller, 1994). In particular, the extent of care an infant requires when there are signs of acute illness, whether none at all or, at the other extreme, hospitalization may alter a mother's thinking about her infant's feeding (Parmelee, 1989). How appropriate a mother views her infant's weight to be in comparison to what she may observe or have in mind as being normative may also be a condition of her working model of feeding.

The question addressed in this study is: To what extent are mothers' working models of infant feeding associated with the infant's development as the infant grows older and with the infant's biologic characteristics? These characteristics include maturity status at birth (prematurity or term) and respiratory health in the early days and weeks after birth (healthy lungs in the neonatal period, acute and transient respiratory distress, or chronic lung disease). Biologic characteristics also include intercurrent acute illness and weight relative to other infants the same age. These questions are clinically important for identifying directions for supporting the development of mothers' working models of infant feeding.

The objectives of this study were to: (a) examine the extent to which caregiving nurturance expressed in mothers' working models of infant feeding changed during the infant's first post-term year; and (b) explore the contribution to the caregiving nurturance of the infant's biologic characteristics in the form of maturity at birth and respiratory health status, intercurrent illness, and weight relative to the population of infants the same age.

Methods

This study was a component of a larger longitudinal study to examine correlates of maternal and infant feeding behavior, infant dietary intake, growth, and development. Data were collected through the infant's first post-term year, beginning with the infant's discharge from the special care nursery and continuing through the 12th post-term month. In this study, dimensions of the mother's working model as expressed at 4 and at 12 months post-term age were examined in relation to the infant's maturity at birth, respiratory health status, intensity of intercurrent acute illness, and weight-for-age relative to the population of infants.

Sample

The participating mothers included 59 mothers of VLBW infants with a history of lung disease and 53 mothers of healthy infants born at term. Mothers of the VLBW infants were recruited during the infant's special care nursery stay, and mothers of the healthy term (HT) infants were recruited from family practice and WIC clinics. The VLBW infants either had a diagnosis of respiratory distress syndrome (RDS) that had resolved without apparent sequelae (n = 29) or a diagnosis of bronchopulmonary dysplasia (BPD), a chronic lung disease (n = 30). Characteristics of the sample are described in Table 1.

Place Table 1 about here

Data Collection Measures and Instruments

Working models of feeding. A focused interview and replay of a videotape of a just-completed feeding were used to aid a mother's recall and description of dimensions of her working model of feeding.

Dimensions of a working model of infant feeding were identified through interviews with mothers in relation to video-taped feeding interaction (Pridham, Van Riper, & Thoyre, 1993) and include: (a) the mother's expectations for or orientation to the feeding, implying her aims for the feeding; (b) the sense the mother has of the infant's agendas and her responsiveness to them; (c) the type of information she uses to make feeding decisions; (d) the timing of her response to infant cues; (e) the strategies the mother uses to maintain or structure the feeding; (f) the criteria the mother uses to assess the adequacy of the feeding; (g) her concern with or attention to the adequacy of the feeding; (h) the extent to which the mother

treats the feeding as if it were co-regulated or a matter of her direction; (i) the mother's rationale for the amount of food fed and for the feeding mode; (j) the bases on which feedings are patterned in relation to each other; and (k) the mother's criteria for determining how well feedings are going. These 11 dimensions were coded from the transcript of the interview using a six-point scale to rate the degree of maternal caregiving nurturance.

A total score for caregiving nurturance was obtained. The standardized alpha coefficient for the 11-item scale was .93 at 4 months and .96 at 12 months. The construct validity of caregiving nurturance was supported by a positive correlation with maternal positive feeding behavior and with absence of maternal negative feeding behavior (r = .24 and .32, respectively, at 4 months; r = .28 and .20, respectively, at 12 months, $p < .05$).

Intensity of illness. The intensity of the infant's acute, intercurrent illness was assessed with data collected from a record of illness signs that mothers kept on a commercially-made calendar through their infant's first post-term year. Mothers were given printed instructions concerning illness signs to record, ratings for the effect of the illness on the infant, and what was done to care for or manage the illness. The illness signs to record were derived from our own previous studies concerning the illnesses that healthy infants have and from the literature concerning the illnesses that premature infants had, both from maternal and clinician report (see, for example, Allen & Jones, 1986; Ford, Rickards, Kitchen, Lissenden, Ryan, & Keith, 1986; McCormick, 1985; Termini, Brooten, Brown, Gennaro, & York, 1990).

The intensity of acute, intercurrent illness was composed of two measures: (a) the average number of days within an assessment period (e.g., the first four months post term, the last 4 months of the first post-term year) for which an illness sign was recorded; and (b) the extent of care required for illness on each day that a sign was noted. The mother selected one of five categories of care to describe what was done to care for or manage illness that day. Each of the five categories of care was weighted with a normalized factor. These factors were obtained from the estimate of relative importance given each category by two family physicians, six primary care pediatricians, and two pediatric pulmonologists. The final set of weights for the five categories were as follows: (a) a day with illness but no treatment = 1; (b) a day of illness with home treatment = 1.39; (c) a day with a call to the physician about the illness = 1.78; (d) a doctor's visit for the illness= 2.49; and (e) a day of hospitalization = 4.05. The day's score for intensity of acute illness was obtained from this weight. These scores were summed to obtain a total score for the assessment period. An average intensity of acute illness score was obtained for each assessment period by dividing the total score by the number of days in the assessment period. For this study, two assessment periods were examined--the 4-month period prior to the 4-month assessment and the 4-month period prior to the 12-month assessment.

Infant weight. The infant's weight compared to that of other infants was assessed in terms of weight-for-age (post term) relative to the median of the population used for the construction of the National Center for Health Statistics growth grid (Hammill, Drizd, Johnson, Reed, & Roche, 1979). A z-score for the weight-for-age (post term) was computed using the ANTHRO program (version 1.01) developed by the Centers for Disease Control (Sullivan & Gorstein, 1990).

Results

Descriptive statistics for the study variables for each maturity/lung health status group are shown in Table 2. Repeated measures analysis of variance results for the effect of maturity/health status group, time (4, 8 months), and the interaction of group and time are shown in Table 3. The effects of time were significant.

Regression of caregiving nurturance on intensity of intercurrent illness, weight-for-age z score, and maturity/lung health status group (dummy variable) showed that none of the independent variables was significantly associated with caregiving nurturance at either 4 or 8 months. For healthy term infants at 4 months, the Beta coefficient for the weight-for-age z score was .29 ($t = 1.92$, $p = .06$).

Put Tables 2 and 3 about here

Discussion

The significantly lower scores for caregiving nurturance at 12 months compared to 4 months post-term age indicate that developmental characteristics of the infant may make a difference in the caregiving nurturance of the mother's working model of feeding. As the infant becomes more competent in self feeding, mothers may give less thought and attention to the infant's feeding or challenges associated with the infant's self feeding may be accompanied by changes in the mother's working model. Further study is needed to learn what factors contribute to lower scores for caregiving nurturance. Maternal characteristics, including the extent of the time the mother feeds the infant and the nature and meaning of her experience in infant feeding, may be factors that explain the decrease in caregiving nurturance along with infant developmental characteristics.

The lack of contribution to caregiving nurturance of infant biologic characteristics at either 4 or at 12 months suggests that, for the infants in general, maternal expectations are not derived from birth maturity, lung health status, intercurrent illness, or weight-for-age. Perhaps mothers are not oriented by clinicians to think of their infants' feeding in terms of needs that are special to the infant. Or mothers may be concerned to think of their infants as being "normal" or like other infants, whether premature and ill in the early days or weeks of life or born at term and healthy. Study of the mothers' expectations and goals for the infant and for herself as the infant's mother may help to explain the lack of association of infant biologic characteristics with the extent of the caregiving nurturance of the mothers' working model of feeding. The kind of support a mother receives from either family members or clinicians concerning the infant's feeding needs may also make a difference in the extent to which infant biologic characteristics condition the caregiving nurturance of her working model of feeding. Exploration of the meaning of the infant's weight for mothers of healthy term infants at 4 months is indicated.

In summary, the caregiving nurturance of mothers' working models of infant feeding was not stable through the infant's first post-term year, on the whole. The infant's development may be a basis of this change. The mother's characteristics and personal experiences in feeding, environmental circumstances, and the meaning of infant behavior and characteristics are factors that potentially shape a mother's working model of infant feeding and are in need of exploration.

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Table 1. Sample Characteristics

Variable	Group BPD (n = 30) f	%	RDS (n = 29) f	%	HT (n = 53) f	%
Infant gender						
Male	16	53.3	11	37.9	25	47.2
Female	14	46.7	18	62.1	28	52.8
Mother						
Race						
African-American	0		4	13.8	5	9.4
Asiatic	1	3.3	0		0	
Latino	1	3.3	0		0	
White	28	93.3	25	86.2	47	88.7
Marital status						
Married or partnered	29	26.7	25	86.2	47	88.6
Single	1	3.3	4	13.7	6	11.4
Number of children						
1 child	15	50.0	13	44.8	19	35.8
2 children	7	23.3	5	17.2	20	37.7
3 children	6	20.0	4	13.8	8	15.1
4 or more children	2	6.7	7	24.1	6	11.4
Education (years)	M = 13.9 SD = 2.64		M = 13.9 SD = 2.73		M = 15.5 SD = 2.8	

Table 2. Descriptive Statistics for the Study Variables for Each Group at 4 and 12 Months

	4 Months						12 Months					
	BPD		RDS		HT		BPD		RDS		HT	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Intensity of acute illness[a]	7.27	7.58	7.52	10.43	4.98	7.05	6.17	6.82	5.43	7.04	11.65	20.98
Weight-for-age z score	- .65	1.07	- .30	.83	.28	.82	-1.20	1.11	- .87	1.03	- .42	.94
Caregiving nurturance	3.97	.64	3.80	.80	4.14	.91	3.62	.91	3.56	1.05	3.79	.88

[a]Mean days of illness in the prior 4 months multiplied by the type of treatment. This value was multiplied by 100 to make the value large enough to be interpretable.

Table 3. Repeated Measures Analysis of Variance for Support

Effect	DF	MS	F	Significance of F
Group	2	1.65	1.90	.15
Time	1	5.14	7.65	.007
Group X Time	2	.07	.10	.90